

*DIVISION 2  
EARTHWORK*

**2.01            CLEARING AND GRUBBING**

**2.01.01        Description**

This work shall consist of cutting, removing from the ground, and disposing of all trees, stumps, brush, shrubs and other vegetation occurring within the right-of-way which interferes with excavation, embankment or clear vision, or are considered otherwise objectionable.

**2.01.02        Protecting Plant Life**

All vegetation which is designated on the plans or by the Engineer to be saved, shall be carefully protected from damage or injury during all construction operations.

**2.01.03        Disposal**

All stumps, brush, limbs, tops, and other debris are to be disposed of by the Contractor. In disposing of any such debris the Contractor shall be responsible for policing any haul routes and shall clean up any spillage resulting from this hauling operation.

**2.01.04        Method of Measurement**

Clearing and grubbing will be measured by horizontal area in acres.

**2.01.05        Basis of Payment**

If the contract includes a separate item for clearing and grubbing the contract unit price per acre shall be payment in full for all work as specified under 2.01.01. If the contract does not include a separate item for clearing and grubbing, this work shall be considered incidental to roadway excavation.

*DIVISION 2  
EARTHWORK*

**2.03**            **REMOVING TREES AND STUMPS**

**2.03.01**        **Description**

This work shall consist of removing trees or stumps where called for on the plans or directed by the Engineer including cutting such trees or stumps and their removal to a minimum depth of two feet (2') below subgrade excavation and proper disposal of the material. This item shall apply to areas outside the limits for clearing and grubbing.

**2.03.02**        **Disposal**

The trees, stumps, roots and debris shall be removed and disposed of as specified under Clearing and Grubbing, 2.01.03.

All timber from which logs, posts, ties, poles, or cordwood can be made shall be hauled to the lot of any abutting property owner desiring this timber whose property adjoins the project site. If no abutting property owner desires this timber, it is then the property of the Contractor.

**2.03.03**        **Method of Measurement**

Trees shall have diameters 8" or greater measured at a point 4' above the base of the tree. Stumps shall have diameters 8" or greater at the top of the stumps. trees or stumps with lesser diameters than noted shall be considered incidental. Where more than one tree has grown from a common stump, each tree or stump will be measured as a separate tree or stump.

**2.03.04**        **Basis of Payment**

If the Contract includes separate items for removing trees and stumps, the Contract unit price per each shall be payment in full for their removal. If the Contract does not include separate items for removing trees and stumps, then all work specified in this section shall be considered as incidental to roadway excavation.

*DIVISION 2*  
*EARTHWORK*

**2.05**            **REMOVING CORDUROY**

**2.05.01**        **Description**

This work shall consist of removing and disposing of all logs, poles stumps, brush and other materials imbedded under the surface of an existing or abandoned road within the limits of the proposed roadbed where excavation to lower elevations is not otherwise required.

**2.05.02**        **Disposal**

Disposal of corduroy excavation shall be in accordance with Clearing and Grubbing 2.01.03.

**2.05.03**        **Method of Measurement**

Removal of corduroy will be measured in cubic yards of volume in their original position, computed by the method of average end areas except where this method is not feasible.

**2.05.04**        **Basis of Payment**

Corduroy which is above the proposed subgrade shall be considered as earth roadway excavation and will be measured and paid for as such, which price shall include payment for the disposal of the corduroy. Corduroy which is below the proposed subgrade shall be removed and paid for as extra work when ordered by the Engineer.

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**2.06**            **REMOVAL OF BRIDGES, WALLS, CULVERTS, AND  
MISCELLANEOUS STRUCTURES**

**2.06.01**        **Description**

This work shall consist of removing in whole or in part all bridges, retaining walls, culverts, catch basins or other miscellaneous structures shown on the plans to be removed or required to be moved for the construction of the project together with the salvaging, storing and disposing of the resulting material.

**2.06.02**        **Construction Methods**

All old culverts, bridges or retaining walls or parts thereof that interfere with new construction shall be removed. Steel and timber super-structures and abutments, and the floors of all concrete masonry culverts that are to be abandoned shall be entirely removed. Concrete and masonry abutments shall be broken down to an elevation two (2) feet below the subgrade elevation. Pipe culverts, catch basin leads, storm sewer and similar structures that are to be abandoned, the tops of which come within four (4) feet of the top of the finished street shall be removed. Pipe culverts, catch basin leads, storm sewers and similar structures at a lower elevation may be left in place if in the judgment of the Engineer they are in a place where the ends can be bulkheaded with a brick wall or equal.

Miscellaneous structures such as old pavement, curb and gutters, sidewalk, masonry, inlets, catch basins and other structures which are not suitable to be left in the street or that interfere with new construction shall be entirely removed within the limit shown on the plans. In removing catch basins and inlets, any live sewer connected with them shall be rebuilt and properly reconnected. In removing old pavement, curb and gutters, sidewalk and similar structures or portions of existing structures that are to be left in the surface of the finished work, the old structure shall be removed to an existing joint, or cut and chipped to a true line with a vertical face. Sufficient removals shall be made to provide for proper grades and connections in the new work.

**2.06.03**        **Disposing of Materials**

All materials having salvage value shall be carefully removed to avoid damage and shall be placed in neat piles of like material outside of construction limits within the right-of-way for disposal by the owner.

If after reasonable notice by the Engineer, the owner does not claim such salvage materials, they shall be disposed of by the Contractor. Salvage brick meeting specification requirements may be used in the construction of drainage structures, and other approved salvage materials may be used in new work if so provided.

All materials that can not be used as above specified, all broken concrete which is matted together with steel reinforcement and all other waste material shall be loaded upon trucks and disposed of as authorized by the Engineer.

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**2.06**            **REMOVAL OF BRIDGES, WALLS, CULVERTS AND  
MISCELLANEOUS STRUCTURES**

**2.06.04**        **Backfilling**

All trenches, holes, or pits resulting from the breaking down or removal of miscellaneous structures shall be backfilled with sand if within the limits of the roadbed of the new street. Such backfill shall be compacted by flooding, or by wetting and tamping as directed by the Engineer. All trenches, holes or pits resulting from the breaking down or removal of miscellaneous structures outside of the limits of the roadbed of the new street shall be filled with solid earth.

**2.06.06**        **Method of Measurement**

Unless otherwise provided, this work will be measured in the original position of the structures to be removed as follows:

Removing curb and gutter will be measured by length along the base of the curb face or along the flow line of the gutter in lineal feet. Removing old pavement, surface course and base course will be measured by area in square yards. Removing masonry structures will be measured by volume in cubic yards. Removing manholes, catch basins, and inlets will be measured as units including all attached parts and connections.

Removing pipe culverts, catch basin leads, storm sewers and similar structures will be measured in length in feet along the centerline of the structure. Removing of steel and timber superstructures will be measured as units including all attached parts and connections.

**2.06.07**        **Basis of Payment**

The contract unit price shall be payment in full for breaking down, removing, disposing of materials, placing and compacting the backfill.

If the contract does not include a separate item for removing any of the miscellaneous structures listed above, removing such structure or structures shall be considered as incidental to roadway excavation.

*DIVISION 2*  
*EARTHWORK*

**2.08**            **ROADWAY EARTHWORK**

**2.08.01**        **Description**

This work shall consist of constructing earth grades by excavation and by placing embankment or fills necessary for the construction of the earth grade including the intersections, entrances and outlawn and maintaining the work in a finished condition until acceptance.

In general, all excavated materials will be classed as roadway excavation except those items which are covered by separate items in the contract.

**2.08.02**        **Salvage of Existing Road Metal**

It is the intent of the City to salvage existing road metal utilizing City Personnel and equipment in advance of the excavation operation if in the opinion of the Engineer that said road metal is in suitable condition to warrant salvage. The Contractor is therefore required to provide seven (7) days notice prior to the start of excavation operations. Once the existing road metal has been salvaged it shall be encumbent upon the Contractor to begin excavation operations with no undue delay. If in the opinion of the Engineer the existing road metal is not in a salvageable condition, the Engineer shall notify the Contractor in writing to that effect and the Contractor may proceed with the excavation.

**2.08.03**        **Roadway Excavation**

As a general rule most streets in the City of Midland require excavation only. The Contractor shall excavate to sub-grade in such a manner as to allow for the sand sub-base below the pavement base as shown on the plans. If the excavation appears to be all sand, tests shall be made to determine the depth of sand below the sub-grade. If tests show the sand to be less than required depth, then the Contractor shall excavate to the proper depth the same as if the sub-grade soil were clay. Any sand taken from excavation which meets requirements of 2.11 may be used for sand sub-base on any street in the project upon approval by the Engineer.

**2.08.04**        **Outlawn Excavation**

The Contractor shall excavate the outlawn to the required cross-section as shown on the plans unless the Engineer determines that soil in the outlawn is unsuitable for the purpose in which case the outlawn shall be excavated to the required depth (2" or 4") below the required finished cross-section. Outlawn is that part of the street Right-of-way which lies between the curb and the property line.

**2.08.05**        **Intersections and Entrances**

Excavation of intersections and entrances shall be done in the same manner as the main portion of the street.

*DIVISION 2  
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**2.08**            **ROADWAY EARTHWORK (con't)**

**2.08.08**        **Constructing Embankments**

Embankments shall be constructed with materials as shown on the typical sections. The materials shall be deposited and compacted by the 12-inch layer method unless some other method is specified or authorized. The material shall be deposited and spread in layers not more than 12 inches in depth, loose measure, parallel to the finished grade and extending to the full width of the embankment. Each layer shall be compacted to not less than 95 percent of the Maximum Unit Weight as determined at the existing moisture content.

**2.08.09**        **Test Rolling**

When called for on the plans or authorized by the Engineer the compaction of the subgrade in embankments and cut sections shall be tested by the use of pneumatic-tired test roller. The use of the test roller as described herein is for testing purposes only, and it is not intended as a requirement for the compaction of embankments or cut sections as specified under Constructing Embankments, 2.08.08.

The test roller shall consist of 4 pneumatic-tired wheels mounted on a rigid steel frame. The wheels shall be evenly spaced in one line across the width of the roller and shall be arranged in such a manner that all wheels will carry approximately equal loads when operated over an uneven surface. The maximum spacing between adjacent wheels shall not exceed the tire width. The tires shall be capable of operating at inflation pressures ranging from 50 to 90 pounds per square inch.

The equipment shall have a suitable body for ballast loading with such capacity that the gross load may be varied from 25 to 50 tons.

Ballast to obtain the weight required by the Engineer shall consist of ingots, concrete blocks, sand bags, or other approved materials, with a uniform, known unit weight, so that the total weight of the ballast used can be readily determined at all times. There shall be sufficient amount of ballast available to load the equipment to a maximum gross weight of 50 tons.

The test roller shall be operated in a systematic manner so that a record may be readily kept of the area tested and the working time required for the testing.

Test rolling shall be conducted at the highest maximum loading and tire pressure that the average compacted soil condition will sustain without causing shear failure as determined by the Engineer.

The test roller shall be operated at a speed between 2 1/2 and 5 miles per hour while testing the sub-grade or sub-base.

*DIVISION 2  
EARTHWORK*

**2.08            ROADWAY EARTHWORK (con't.)**

**2.08.16        Basis of Payment**

"Roadway Earthwork" will be paid for at the Contract unit price per cubic yard which price shall be payment in full for all work specified under the general headings of "excavation" or "embankment" for which no separate unit price is included in the Contract.

No extra allowance will be paid for various length of hauls from the project site to the disposal site.

"Test Rolling" will be paid for at the Contract Unit price per hour, which price shall be payment in full for furnishing the roller complete with tractor for pulling the roller, operator, fuel, and supplies necessary to test the compaction of the grade in the area and at the time required by the Engineer.

When a change in tire pressure or a change in the gross weight of the roller is ordered by the Engineer, half the time required to make such change will be paid for at the Contract unit price per hour for Test Rolling, which price shall be payment in full for furnishing all the labor, equipment and materials to make such change. No payment will be made for the time required for servicing and repairing the equipment or when moving from one testing site to another except that the Contractor will be paid half of the actual time required for moving the roller around and structure location if it is necessary to transport the roller on special equipment.

Unstable conditions encountered either before or during test rolling operations, which result from the failure of the Contractor to attain and maintain the specified densities shall be corrected by the Contractor to attain and maintain the specified densities shall be corrected by the Contractor at his own expense. Unstable conditions encountered such as excessive moisture and unsuitable soils, not the responsibility of the Contractor, shall be corrected and will be paid for at the contract unit prices for the items involved or as extra work.

There will be no adjustment in the Contract unit price, regardless of the percentage of increase or decrease above or below the contract quantity, for the item of Test Rolling.



*DIVISION 2  
EARTHWORK*

**2.11        SUBBASE**

**2.11.01        Description**

This work shall consist of the preparation of the subgrade and the placing thereon of a subbase of the granular material specified.

**2.11.02        Materials**

The material shall meet the requirements specified in Division 8, of the MDOT Standard Specification:

Granular Material	Class II	-8.02
Surfacing Aggregate	22A, 22B, 23A	-8.02

In these specifications Granular Materials Class II will be referred to as "sand subbase", to differentiate from the surfacing aggregate to be identified as "Select Subbase".

When "Selected Subbase" is required for the construction of a concrete pavement, surfacing Aggregate 22A shall be used unless otherwise specified.

**2.11.03        Construction Methods**

In areas where the natural subgrade consists of sand which, in the opinion of the Engineer, is suitable to be used as sand subbase, the excavation limits shall be those necessary for the placement of the base aggregate unless a select subbase is indicated on the plans.

In areas where the natural subgrade material is not suitable to be used for sand subbase, the excavation limits shall be such as to provide for the specified subbase material. The excavation for sand subbase shall extend two feet (2') back of the curb on each side of the street.

Where an extra depth of excavation is required because of the need for a sand subbase, the subgrade shall be trimmed and smoothed to the required cross-section to receive the sand subbase as shown on the plans. No sand subbase shall be placed until the subgrade has been finished as specified.

Sand subbase shall be deposited and spread extending to the full width of the fill area. As a general rule sand subbase does not exceed 12" in depth and therefore, may be spread in one layer provided the compaction requirements can be met.

The subbase layer shall be compacted to not less than 95 percent of the maximum unit weight at optimum moisture, unless otherwise specified or authorized, prior to the placement of any succeeding materials.

The Contractor shall protect compacted subbase from becoming rutted or distorted and any such rutting or distortion shall be corrected at his expense.

*DIVISION 2  
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**2.11.04      Selected Subbase**

When provided on the plans or authorized by the Engineer, the upper portion of the subbase shall be constructed of Selected Subbase in accordance with methods specified in Section 3.01.07.

**2.11.05      Method of Measurement**

Sand subbase provided by Contractor shall be measured by the method of end areas compacted in place.

Selected Subbase to the specified thickness will be measured by area in square yards.

**2.11.06      Basis of Payment**

Sand subbase provided by the Contractor will be paid for at the contract unit price per cubic yard.

Selected Subbase provided by the Contractor will be paid for at the contract unit price per square yard.

*DIVISION 2  
EARTHWORK*

**2.13**            **SOIL EROSION AND SEDIMENTATION CONTROL**

**2.13.01**        **Description**

This work shall consist of the construction and maintenance of erosion controls and the timing limitations required to minimize the erosion of soil and the sedimentation of watercourses.

**2.13.02**        **Construction Methods**

On all lawn areas, or areas not falling within the traveled portions of roadways, disturbed by operations under contract, it shall be the responsibility of the Contractor to provide sufficient topsoil, seed, fertilizer, and mulch so as to stabilize the disturbed areas with vegetative ground cover. This work shall be done in accordance with the Standards and Specifications for "Permanent Seeding" as published in "Soil Erosion and Sediment Control Standards and Specifications for Bay, Midland, and Saginaw Counties".

Copies of the above mentioned standards are available at \$4.00 per book from the Midland County soil Conservation District and the City of Midland building Department. A copy may be viewed in the office of the City Engineer. Other temporary or permanent soil erosion and sedimentation controls shall be constructed as shown on the plans, or as directed by the Engineer.

This work shall be started and completed as soon as practicable following any grading operation.

**2.13.03**        **Method of Measurement**

Each item of work shall be measured in units as shown on the Contract Itemized Bid Sheet if the work completed is not incidental construction.

**2.13.04**        **Basis of Payment**

If the Contract includes a separate item for soil erosion and sedimentation controls, the unit price bid for each item shall be payment in full for all work as specified under 2.13.01. If the Contract does not include a separate item for soil erosion and sedimentation controls, this work shall be considered incidental to earthwork.

*DIVISION 2*  
*EARTHWORK*

**2.16**        **FINE GRADING**

**2.16.01**        **Description**

This work shall consist of preparing the subbase according to specifications prior to the placement of the aggregate base course or concrete pavement if specified. This item shall also apply in cases where the natural subgrade is suitable for use as the subbase.

**2.16.02**        **Construction Methods**

After the subbase has been placed the finished subbase shall be compacted to not less than 95% of the maximum unit weight and smoothed and trimmed to the required line and grade and cross-section to receive the aggregate base course or concrete pavement.

**2.16.03**        **Method of Measurement**

Fine grading will be measured by length in feet along the street centerline. Measurements along intersection streets from the centerline of the main street being improved to the end of the return are not included in the measurements.

On cul-de-sacs, fine grading will be measured by length in feet along the street centerline, the ending point of the measurement in the cul-de-sac.

**2.16.04**        **Basis of Payment**

When included as a pay item the contract unit price per lineal foot shall be the payment in full for all work specified under fine grading. If the contract does not provide a pay item for fine grading, all such work as specified under fine grading shall be considered as incidental to the contract and any costs resulting therefrom shall be recovered under item 2.11 Subbase or, if there be no subbase specified, under item 2.08 Roadway Excavation.